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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Anders Astrom

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VENABLE LLP
P.O. BOX 34385
WASHINGTON, DC 20043-9998

EXAMINER

TSAI, TSUNG YIN

ART UNIT

PAPER NUMBER

2624

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/774,948	Applicant(s) ASTROM ET AL.	
	Examiner TSUNG-YIN TSAI	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/1/2010 has been entered.

Response to Arguments

2. Applicant cancel claims 1-16 without disclaimer or prejudice as stated on page 7 and added new claims 17-38 for examination.

Information Disclosure Statement

3. No new IDS submitted with response dated 3/1/2010 for consideration.

35 USC 102 – Claim Rejection

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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5. Claims 17-20, 26-31 and 37-38 are rejected under 35 U.S.C. 102(b) as being unpatentable over Takashi et al (US 3,719,775).

(1) Regarding claim 17, similarly claim 28:

Takashi et al teaches the following subject matter:

- casting incident light in a linear shape from one light source onto a specific location on an object

[figure 1, figure 4-8 and column 2 lines 45-60 (linear laser light for scanning object)];

- capturing detected light with one image sensor while casting the incident light, the detected light including at least

[figure 2, especially part 7 and column 3 lines 59-75 (optical system to pick up light)]

- (i) light from reflection of the incident light

[figure 9, especially data plotting reflection signal and column 5 lines 15-50], and

- (ii) light from scattering of the incident light

[figure 9, especially data plot of scattered light and column 5 lines 15-50];

- generating a record associated with the specific location from the detected light, the record including at least

[column 2 lines 45-60 (information relating to 3D condition of object between time radiating the laser)]

- (i) first information about the reflection of the incident light
[figure 9, especially data plotting reflection signal and column 5 lines 15-50], and
- (ii) second information about the scattering of the incident light
[figure 9, especially data plot of scattered light and column 5 lines 15-50]; and
- determining an object profile for the specific location and an object scattering property for the specific location by reading the first and second information in the record associated with the specific location
[column 2 lines 45-62, especially lines 59-62 (3D condition between time scans) and column 6 lines 65-70 (system for special object for which image pickup system is used)].

(2) Regarding claim 18, similarly claim 29:

Takashi et al further teaches:

- wherein generating the record comprises forming a first image from the captured light
[column 2 lines 45-60 (obtaining 2D image from reflected light as well as 3D condition of foreground object)].

(3) Regarding claim 19, similarly claim 30:

Takashi et al further teaches:

- the light source is a laser forming a line of laser light on the object

[figure 1 and figure 4 and column 2 lines 45-51 (laser line on a long linear laser light on object for scanning)];

- the first image contains a profile corresponding to the line of laser light on the object

[column 2 lines 55-60 (2D image from reflected signal, as well as 3D condition of foreground object can be obtained)];

- the object profile is determined using the profile in the first image

[column 2 lines 55-60 (3D information of foreground object, wherein 3D is seen as object profile)]; and

- the object scattering property is determined using an intensity distribution of the profile in the first image

[figure 9, especially plotted scattered light and column 5 lines 25-50 (intensity of scattered light affect on image)].

(3) Regarding claim 20, similarly claim 31:

Takashi et al further teaches:

- identifying a middle area and an edge area in the intensity distribution

[figure 9, especially t3 for middle area and other times for edges and column 5 lines 15-53]; and

- comparing an intensity in the edge area with at least an intensity in the middle area

[figure 9 and column 5 lines 15-53].

(4) Regarding claim 26, similarly claim 37:

Takashi et al further teaches:

- wherein the object is elongate in one direction essentially perpendicular to the linear shape of the incident light

[figure 1 and 4, column 4 lines 44-50 (radiated line perpendicular to airplane)].

(5) Regarding claim 27, similarly claim 38:

Takashi et al further teaches:

- wherein at least one of the light source and the object is moving while the incident light is cast and the detected light is captured

[column 5 lines 1-5 and column 7 lines 30-45 (movable or stationary body for light capture)].

35 USC 103 – Claim Rejection

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 21-25 and 32-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takashi et al (US 3,719,775) as applied to claims 17 and 29 above respectively, and further in view of Hsu et al (US 6,934,420).

(1) Regarding claim 21, similarly claim 32:

Takashi et al teaches all the subject matter above, but not the following subject matter:

- wherein generating the record further comprises processing the first image to generate a second image having a reduced data quantity compared to the first image.

Hsu et al teaches the following subject matter:

- wherein generating the record further comprises processing the first image to generate a second image having a reduced data quantity compared to the first image

[figures 4-6 and column 7 lines 17-51 (wavelet transformation, where wavelet images are of reduce quantity)].

It would have been obvious to one skill in the art at the time of the invention to modify Takashi et al by Hsu et al such arrangement would advantageously offer much computation savings as disclose by Hsu et al in column 7 lines 50-51.

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(2) Regarding claim 22, similarly claim 33:

- wherein the first image includes image information distributed in rows and columns that represents at least part of the linear shape, and wherein the method further comprises:

- (i) successively selecting respective subsets of the rows

[figures 4-6 and column 7 lines 17-51];

- (ii) for each row in each of the subsets, determining whether the row's portion of the image information meets a criterion, and if so registering in the record any of the columns where the criterion is exceeded

[figures 4-6 and column 7 lines 17-51, especially lines 30-40 (use of filters to meet criteria)]; and

- (iii) generating a representative row for each of the subsets using the image information of the rows in the respective subset, the second image formed by the representative rows and containing a version of the linear shape of the incident light

[figures 4-6 and column 7 lines 177-51, especially lines 30-40 (row interpolation for second image from filter data)].

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(3) Regarding claim 23, similarly claim 34:

Hsu et al further teaches:

wherein generating each representative row comprises:

- processing the portion of the image information of each row in the subset

[figures 4-6 and column 7 lines 17-51, especially lines 30-40 (filtering is seen as processing portion of information)]; and

- detecting, while processing, whether a sum of added image information for any of the columns exceeds the criterion

[figures 4-6 and column 7 lines 17-51, especially lines 30-50 (summing and other processing of data)].

(4) Regarding claim 24, similarly claim 35:

Hsu et al further teaches:

- wherein the processing comprises summing the portion of the image information of each row in the subset

[figures 4-6 and column 7 lines 17-51, especially lines 30-40 (summing of filter data)].

(5) Regarding claim 25, similarly claim 36:

Hsu et al further teaches:

- wherein the processing comprises performing a max operation on the portion of the image information of each row in the subset

[figures 4-6 and column 7 lines 17-51, especially lines 30-40 (highpass filtering for max image data)].

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Chasson (US 4,188,544) discloses Method and apparatus for automatically processing a workpiece employing calibrated scanning
- Daher (US 5,327,254) discloses Method and apparatus for compressing and decompressing image data
- Soest (US 5,703,960) discloses Lumber defect scanning including multi-dimensional pattern recognition
- Tsukada et al (US 5,831,748) discloses Image processor
- Chan et al (US 6,037,579) discloses Optical interferometer employing multiple detectors to detect spatially distorted wavefront in imaging of scattering media
- Ben-Dove et al (US 6,094,269) discloses Apparatus and method for optically measuring an object surface contour
- Nevis (US 6,097,849) discloses Automated image enhancement for laser line scan data
- Good et al (US 6,382,515) discloses Automated system and method for identifying and measuring packages transported through a laser scanning tunnel

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TSUNG-YIN TSAI whose telephone number is (571)270-1671. The examiner can normally be reached on Monday - Friday 8 am - 5 pm ESP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vu Le can be reached on (571)272-7332. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tsung-Yin Tsai/
Examiner, Art Unit 2624
March 22, 2010

/Vu Le/
Supervisory Patent Examiner, Art Unit 2624